The Influence of pH & it's Effects on Germination, Leaf Number, & Growth Rate of *Arabidopsis thaliana*

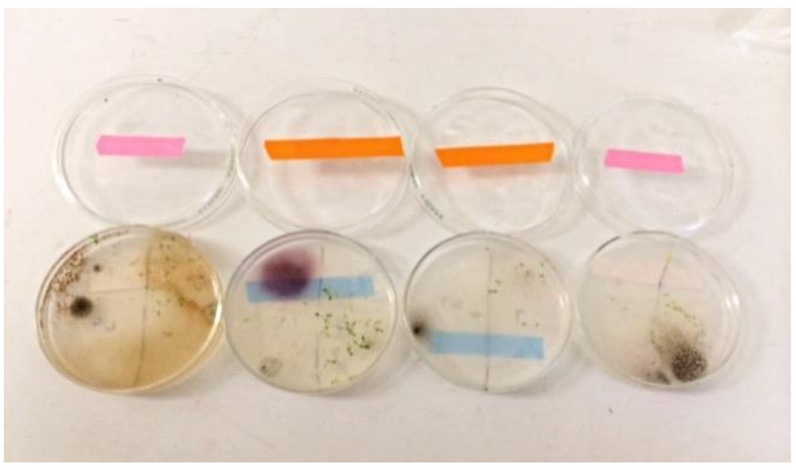
Loren Cagno, Tiffany Zapata, Jessica Nwabuoku
Biology Program, School of Arts and Sciences
University of Bridgeport, Bridgeport, CT

Materials

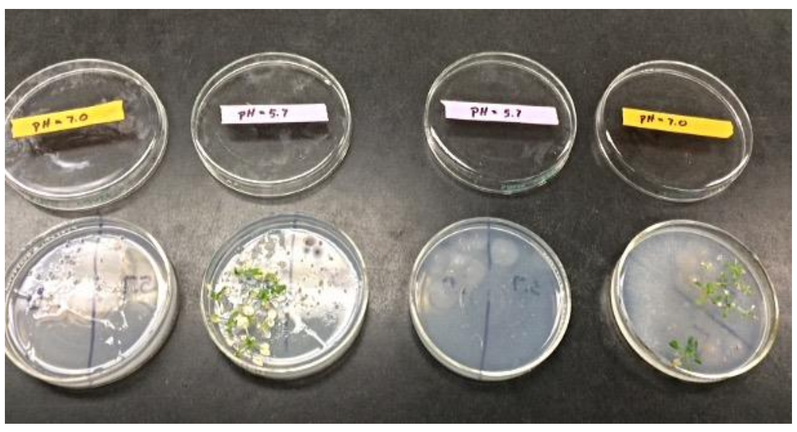
- *Arabidopsis thaliana seeds*
- 4 Petri Dishes
- MS Agar Solution

Methods

- Plates 1 & 2 were pH 5.7
- Plates 3 & 4 were pH 7.0
- Half of the seeds were stratified in a pH of 5.7 and the other half in a pH of 7.0
- 25 seeds each from a pH 5.7 & pH 7.0 were planted in all 4 plates
- The plates were kept in a 16:8 chamber of 20ºC day/ 18ºC night.



First experiment conducted with mold grown at Day 20.



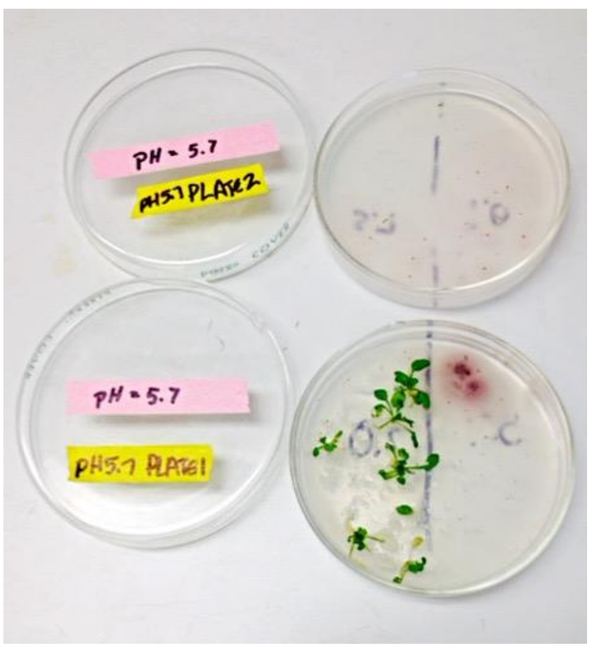
Final experiment with minimal mold growth. Shown at Day 30.

Introduction

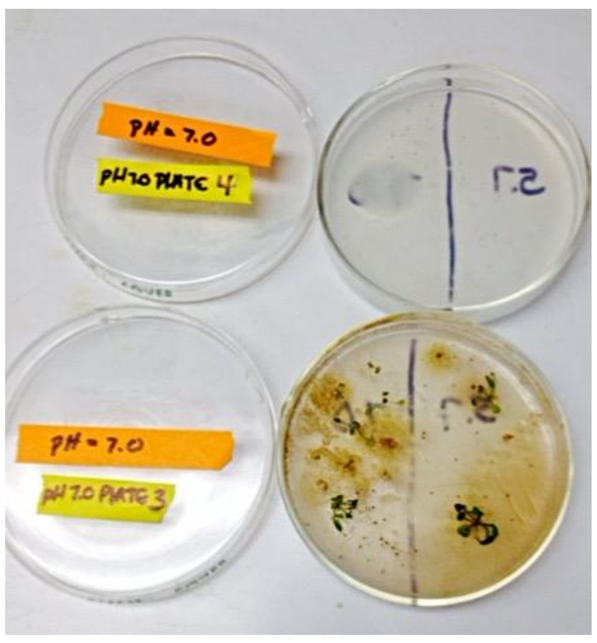
Arabidopsis thaliana (Col gl1) seeds were stratified in either a pH 5.7 or pH 7.0 solution. Plates 1 & 2 had a pH 5.7 and plates 3 & 4 had a pH 7.0, 50 seeds were plated in each plate. The number of germinated seeds, leaf number, and hypocotyl length were measured every 10 days. The seeds stratified in pH 7.0 and plated in pH 5.7 have shown the most growth. The seeds stratified in pH 5.7 and plated in pH 5.7 have shown the least amount of growth. Mold contamination may have been a factor. The pH will have an effect on the germination and growth of *A. thaliana* due to the loss of vital nutrients.

Hypothesis

The germination rate of *Arabidopsis thaliana* will be reduced when the seeds are stratified in an acidic pH of 5.7.



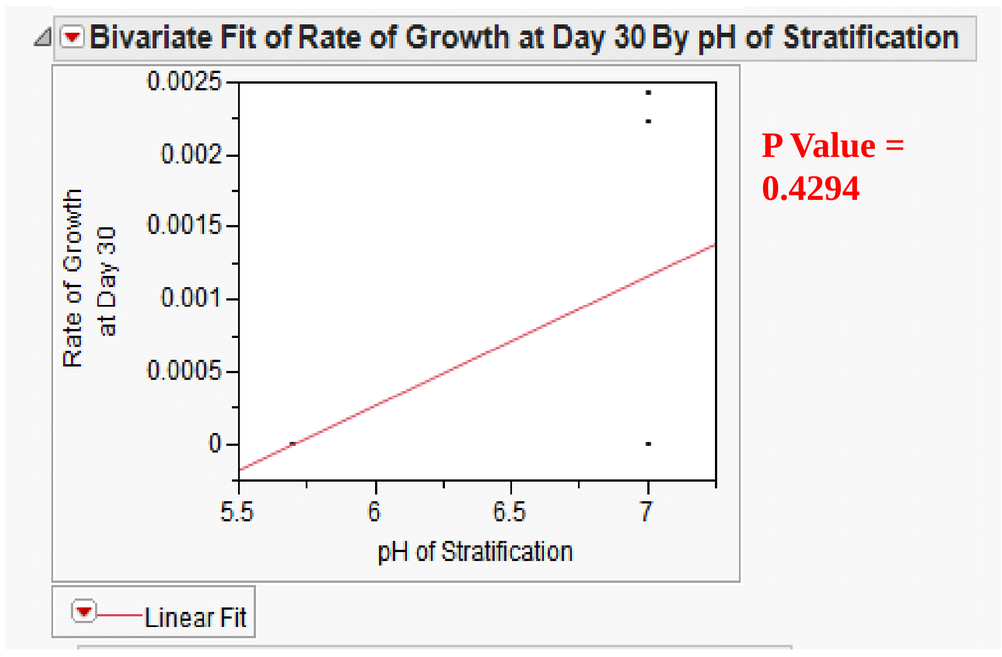
Plates 1 and 2 at Day 30



Plates 3 and 4 at Day 30

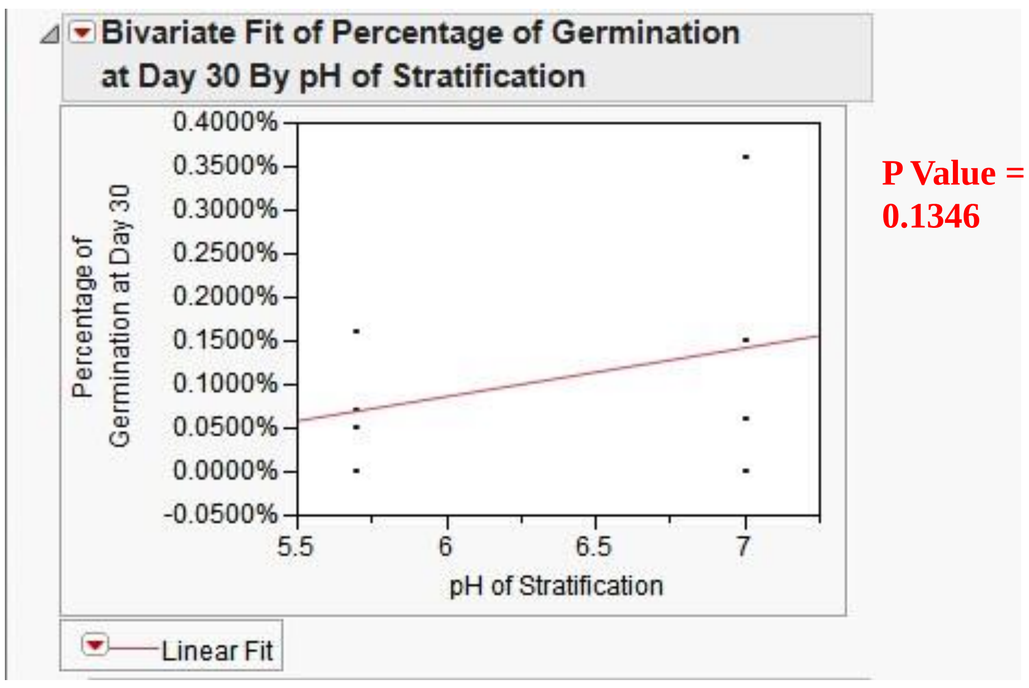
Results

- Mold grew during the first 20 days of plating the seeds.
- The seeds were re-stratified and plated with minor growth of mold.
- By day 30, the seeds stratified in a pH of 7.0 and plated in a pH of 5.7 were 0.36% to germination and exhibited the highest growth rate.
- Seeds stratified in a pH of 5.7 and plated in a pH of 5.7 had a germination rate 0.05% and exhibited the least amount of growth.



P Value = 0.4294

This graph shows the rate of growth of *A. thaliana* at day 30. It shows that as the stratification of the seeds become more acidic, the rate of growth decreased.



P Value = 0.1346

This graph shows the rate of germination of *A. thaliana* at Day 30. It shows that as the stratification of the seeds become more acidic, the rate of germination decreased.

Conclusion

After 30 and 40 days, *Arabidopsis thaliana* seeds that were stratified in a pH of 7.0 and were plated in a pH of 5.7 exhibited an increased germination rate. However, the seeds that were stratified in a pH of 5.7 and were plated in a pH of 7.0 plate exhibited a reduced germination rate. To conclude, it was hypothesized that the seeds exposed to an acidic pH of 5.7 would have a reduced germination rate and the growth of plants would be reduced once exposed to a lower pH level.